

General

Title

Perinatal care: percentage of high-risk newborns with staphylococcal and gram negative septicemias or bacteremias.

Source(s)

Specifications manual for Joint Commission national quality measures, version 2016A. Oakbrook Terrace (IL): The Joint Commission; Effective 2016 Jul 1. various p.

Measure Domain

Primary Measure Domain

Clinical Quality Measures: Outcome

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure is used to assess the percentage of high-risk newborns with staphylococcal or gram negative septicemias or bacteremias.

Rationale

Health care-associated bacteremia is significant problem for infants admitted into neonatal intensive care units (NICUs) and other hospital units. This is especially true for very low birth weight infants who are at high risk for these infections due to their immature immune systems and need for invasive monitoring and supportive care (Adams-Chapman & Stoll, 2002; Bloom et al., 2003; Clark et al., "Prevention," 2004; Clark et al., "Nosocomial," 2004; Gaynes et al., 1996; Payne et al., 2004; Sohn et al., 2001; Stoll et al., 2002). Reported health care-associated infection rates range from 6% to 33%, but the rate varies widely among different centers (Adams-Chapman & Stoll, 2002; Bloom et al., 2003; Clark et al., "Nosocomial," 2004; Sohn et al., 2001; Stoll et al., 2002). Mortality rates are high and infections result in increased

length of stay as well as increased hospital costs and charges (Adams-Chapman & Stoll, 2002; Bloom et al., 2003; Clark et al., "Nosocomial," 2004; Horbar et al., 2001; Killbride et al., "Implementation," 2003; Sohn et al., 2001; Stoll et al., 2002).

The incidence of health care-associated bacteremia increases with decreasing birth weight. Other risk factors include central venous catheter use, prolonged time using parenteral nutrition, prolonged time on mechanical ventilation, use of H2-blocking agents, and overcrowding or heavy staff loads (Adams-Chapman & Stoll, 2002; Barton, Hodgman, & Pavlova, 1999; Gaynes et al., 1996; Stoll et al., 2002). The most common causative organisms are coagulase-negative staphylococci, *Staphylococcus aureus*, enterococci, *Enterobacter* sp, and *Escherichia coli* (Adams-Chapman & Stoll, 2002; Clark et al., "Nosocomial," 2004; Gaynes et al., 1996; Horbar et al., 2001; Payne et al., 2004; Sohn et al., 2001; Stoll et al., 2002).

Effective preventive measures range from simple hand-washing protocols or closed medication delivery systems to more elaborate multidisciplinary quality improvement plans involving hand-washing, nutrition, skin care, respiratory care, vascular access, and diagnostic practices. All of these interventions have been shown to substantially reduce infection rates, albeit in nonrandomized studies using historical or concurrent control units (Adams-Chapman & Stoll, 2002; Aly et al., 2005; Bloom et al., 2003; Clark et al., "Prevention," 2004; Clark et al., "Nosocomial," 2004; Horbar et al., 2001; Lam et al., 2004; Killbride et al., "Implementation," 2003; Killbride et al., "Evaluation," 2003; Ng et al., 2004; Schelonka et al., 2006). For example, six Vermont Oxford Network NICUs reduced their rates of coagulase-negative staphylococcus infections from 22.0% in 1994 to 16.6% in 1996 after implementing a quality improvement model (versus a much smaller decrease from 15.4% to 14.5% at 66 comparison NICUs) (Horbar et al., 2001). A similar reduction from 24.6% to 16.4% was achieved with a multi-modality, multi-hospital intervention focusing on hand hygiene with an effective agent before and after every patient contact, eliminating hand jewelry and artificial nails, using maximal barrier precautions during central venous catheter insertion, decreasing the number of skin punctures, reducing the duration of intravenous lipid and deep line use, and improving the diagnosis of health care-associated infections. (Killbride et al., "Implementation," 2003; Killbride et al., "Evaluation," 2003).

Given the fragility and susceptibility of the patient population, a baseline level of health care-associated infections will be expected, even with good protocols in place. However, those centers that have prevention protocols, and are able to encourage health care workers to adhere to these protocols, will probably have success in reducing their rates of health care-associated bacteremia in their neonatal population. Indeed, several quasi-experimental studies have demonstrated that NICUs can lower their infection rates (based on positive blood cultures) from as high as 13.5 per 1,000 patient days to as low as 3.0 per 1,000 patient days (Adams-Chapman & Stoll, 2002; Aly et al., 2005; Bloom et al., 2003; Clark et al., "Prevention," 2004; Clark et al., "Nosocomial," 2004; Horbar et al., 2001; Lam et al., 2004; Killbride et al., "Implementation," 2003; Killbride et al., "Evaluation," 2003; Ng et al., 2004; Schelonka et al., 2006).

Evidence for Rationale

Adams-Chapman I, Stoll BJ. Prevention of nosocomial infections in the neonatal intensive care unit. *Curr Opin Pediatr.* 2002 Apr;14(2):157-64. [80 references] [PubMed](#)

Aly H, Herson V, Duncan A, Herr J, Bender J, Patel K, El-Mohandes AA. Is bloodstream infection preventable among premature infants? A tale of two cities. *Pediatrics.* 2005 Jun;115(6):1513-8. [PubMed](#)

Barton L, Hodgman JE, Pavlova Z. Causes of death in the extremely low birth weight infant. *Pediatrics.* 1999 Feb;103(2):446-51. [PubMed](#)

Bloom BT, Craddock A, Delmore PM, Kurlinski JP, Voelker M, Landfish N, Rodriguez-Pierce M, Swanton

D, Rossi J, Ehlen J, Harmon C, Deterding J, Houser F. Reducing acquired infections in the NICU: observing and implementing meaningful differences in process between high and low acquired infection rate centers. *J Perinatol*. 2003 Sep;23(6):489-92. [PubMed](#)

Clark R, Powers R, White R, Bloom B, Sanchez P, Benjamin DK Jr. Nosocomial infection in the NICU: a medical complication or unavoidable problem. *J Perinatol*. 2004 Jun;24(6):382-8. [100 references] [PubMed](#)

Clark R, Powers R, White R, Bloom B, Sanchez P, Benjamin DK Jr. Prevention and treatment of nosocomial sepsis in the NICU. *J Perinatol*. 2004 Jul;24(7):446-53. [139 references] [PubMed](#)

Gaynes RP, Edwards JR, Jarvis WR, Culver DH, Tolson JS, Martone WJ. Nosocomial infections among neonates in high-risk nurseries in the United States. National Nosocomial Infections Surveillance System. *Pediatrics*. 1996 Sep;98(3 Pt 1):357-61. [PubMed](#)

Horbar JD, Rogowski J, Plsek PE, Delmore P, Edwards WH, Hocker J, Kantak AD, Lewallen P, Lewis W, Lewit E, McCarroll CJ, Mujsce D, Payne NR, Shiono P, Soll RF, Leahy K, Carpenter JH. Collaborative quality improvement for neonatal intensive care. NIC/Q Project Investigators of the Vermont Oxford Network. *Pediatrics*. 2001 Jan;107(1):14-22. [PubMed](#)

Killbride HW, Powers R, Wirtschafter DD. Evaluation and development of potentially better practices to prevent neonatal nosocomial bacteremia. *Pediatrics*. 2003;111(4 Pt 2):e504-18.

Killbride HW, Wirtschafter DD, Powers RJ, Sheehan MB. Implementation of evidence-based potentially better practices to decrease nosocomial infections. *Pediatrics*. 2003;111(4 Pt 2):e519-33.

Lam BC, Lee J, Lau YL. Hand hygiene practices in a neonatal intensive care unit: a multimodal intervention and impact on nosocomial infection. *Pediatrics*. 2004 Nov;114(5):e565-71. [PubMed](#)

Ng PC, Wong HL, Lyon DJ, So KW, Liu F, Lam RK, Wong E, Cheng AF, Fok TF. Combined use of alcohol hand rub and gloves reduces the incidence of late onset infection in very low birthweight infants. *Arch Dis Child Fetal Neonatal Ed*. 2004 Jul;89(4):F336-40. [PubMed](#)

Payne NR, Carpenter JH, Badger GJ, Horbar JD, Rogowski J. Marginal increase in cost and excess length of stay associated with nosocomial bloodstream infections in surviving very low birth weight infants. *Pediatrics*. 2004 Aug;114(2):348-55. [PubMed](#)

Schelonka RL, Scruggs S, Nichols K, Dimmitt RA, Carlo WA. Sustained reductions in neonatal nosocomial infection rates following a comprehensive infection control intervention. *J Perinatol*. 2006 Mar;26(3):176-9. [PubMed](#)

Sohn AH, Garrett DO, Sinkowitz-Cochran RL, Grohskopf LA, Levine GL, Stover BH, Siegel JD, Jarvis WR, Pediatric Prevention Network. Prevalence of nosocomial infections in neonatal intensive care unit patients: Results from the first national point-prevalence survey. *J Pediatr*. 2001 Dec;139(6):821-7. [PubMed](#)

Specifications manual for Joint Commission national quality measures, version 2016A. Oakbrook Terrace (IL): The Joint Commission; Effective 2016 Jul 1. various p.

Stoll BJ, Hansen N, Fanaroff AA, Wright LL, Carlo WA, Ehrenkranz RA, Lemons JA, Donovan EF, Stark AR, Tyson JE, Oh W, Bauer CR, Korones SB, Shankaran S, Laptook AR, Stevenson DK, Papile LA, Poole WK. Late-onset sepsis in very low birth weight neonates: the experience of the NICHD Neonatal Research Network. *Pediatrics*. 2002 Aug;110(2 Pt 1):285-91. [PubMed](#)

Primary Health Components

Staphylococcal or gram negative septicemia/bacteremia; high-risk newborns

Denominator Description

Liveborn newborns (see the related "Denominator Inclusions/Exclusions" field)

Numerator Description

Newborns with septicemia or bacteremia (see the related "Numerator Inclusions/Exclusions" field)

Evidence Supporting the Measure

Type of Evidence Supporting the Criterion of Quality for the Measure

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Additional Information Supporting Need for the Measure

Unspecified

Extent of Measure Testing

Twenty-six contracted performance measurement systems (PMS) agreed to support the perinatal care measures. Joint Commission staff defined and developed a database structure for electronic receipt of measure data and a verification process was implemented to assure that measures were embedded into the measurement system's technical infrastructures and into their data collection tools in accord with Joint Commission specifications. Joint Commission staff also verified data collection tools and provided education regarding the performance measure set to PMS vendors, who in turn provided education and ongoing support to their contracted hospitals.

Once sufficient data to support this effort were received by The Joint Commission, a reliability assessment of the measures and individual data elements was conducted from October 2011 through January 2012. A data collection tool was developed to facilitate the reabstraction of selected medical records and assessment of the reliability of the data elements. Reliability test site visits were conducted by Joint Commission staff at a subset of 12 randomly-selected hospitals. Selection of the sites was based on multiple characteristics, including hospital demographics, bed size and type of facility.

In the course of the reliability site visits, electronic and paper medical records were blindly reabstracted by Joint Commission staff. Reabstracted data elements were then compared with the hospital's originally abstracted data on a data element to data element basis. Differences in abstraction were investigated and adjudicated in order to understand the reasons for any disparities. In addition, structured focus group discussions were held at each site to gather additional feedback on the measures. A resource evaluation was also completed by the site visit hospitals to assess the cost and time associated with data collection effort. Feedback from the focus group discussions has been incorporated into the measure.

Evidence for Extent of Measure Testing

State of Use of the Measure

State of Use

Current routine use

Current Use

not defined yet

Application of the Measure in its Current Use

Measurement Setting

Hospital Inpatient

Professionals Involved in Delivery of Health Services

not defined yet

Least Aggregated Level of Services Delivery Addressed

Single Health Care Delivery or Public Health Organizations

Statement of Acceptable Minimum Sample Size

Does not apply to this measure

Target Population Age

Age at admission less than or equal to 2 days

Target Population Gender

Either male or female

National Strategy for Quality Improvement in Health Care

National Quality Strategy Aim

National Quality Strategy Priority

Health and Well-being of Communities

Making Care Safer

Prevention and Treatment of Leading Causes of Mortality

Institute of Medicine (IOM) National Health Care Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Safety

Data Collection for the Measure

Case Finding Period

Discharges July 1 through December 31

Denominator Sampling Frame

Patients associated with provider

Denominator (Index) Event or Characteristic

Clinical Condition

Institutionalization

Therapeutic Intervention

Denominator Time Window

not defined yet

Denominator Inclusions/Exclusions

Inclusions

Liveborn newborns with *International Classification of Diseases, Tenth Revision, Clinical Modification*

(ICD-10-CM) *Other Diagnosis Codes* for birth weight between 500 and 1499 g (as defined in the appendices of the original measure documentation) OR *Birth Weight* between 500 and 1499 g
OR

ICD-10-CM *Other Diagnosis Codes* for birth weight greater than or equal to 1500 g (as defined in the appendices of the original measure documentation) OR *Birth Weight* greater than or equal to 1500 g who experienced one or more of the following:

Experienced death

International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-PCS) Principal Procedure Code or ICD-10-PCS Other Procedure Codes for major surgery (as defined in the appendices of the original measure documentation)

ICD-10-PCS *Principal Procedure Code or ICD-10-PCS Other Procedure Codes* for mechanical ventilation (as defined in the appendices of the original measure documentation)

Transferred in from another acute care hospital or health care setting within 2 days of birth

Exclusions

ICD-10-CM *Principal Diagnosis Code* for septicemias or bacteremias (as defined in the appendices of the original measure documentation)

ICD-10-CM *Other Diagnosis Codes* for septicemias or bacteremias (as defined in the appendices of the original measure documentation) or ICD-10-CM *Principal or Other Diagnosis Codes* for newborn septicemia or bacteremia (as defined in the appendices of the original measure documentation) with a *Bloodstream Infection Present on Admission*

ICD-10-CM *Other Diagnosis Codes* for birth weight less than 500 g (as defined in the appendices of the original measure documentation) OR *Birth Weight* less than 500 g

Length of Stay (LOS) less than 2 days

Exclusions/Exceptions

not defined yet

Numerator Inclusions/Exclusions

Inclusions

International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) Other Diagnosis Codes for newborn septicemia or bacteremia (as defined in the appendices of the original measure documentation) with a *Bloodstream Infection Confirmed*
OR

ICD-10-CM *Other Diagnosis Codes* for sepsis (as defined in the appendices of the original measure documentation) with a *Bloodstream Infection Confirmed*

Exclusions

None

Numerator Search Strategy

Institutionalization

Data Source

Administrative clinical data

Paper medical record

Type of Health State

Adverse Health State

Instruments Used and/or Associated with the Measure

- Perinatal Care (PC) Initial Patient Population Algorithm Flowchart
- PC-04: Health Care-associated Bloodstream Infections in Newborns Flowchart

Computation of the Measure

Measure Specifies Disaggregation

Does not apply to this measure

Scoring

Rate/Proportion

Interpretation of Score

Desired value is a lower score

Allowance for Patient or Population Factors

not defined yet

Description of Allowance for Patient or Population Factors

Risk adjustment for this measure is applied to the following data elements:

Birth Weight
Discharge Disposition
International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) Principal
Diagnosis Code
ICD-10-CM Other Diagnosis Codes

Standard of Comparison

not defined yet

Identifying Information

Original Title

PC-04: Health care-associated bloodstream infections in newborns.

Measure Collection Name

National Quality Core Measures

Measure Set Name

Perinatal Care

Submitter

The Joint Commission - Health Care Accreditation Organization

Developer

The Joint Commission - Health Care Accreditation Organization

Funding Source(s)

No external funding was received.

Composition of the Group that Developed the Measure

The Perinatal Care Technical Advisory Panel (PC TAP) recommended which National Quality Forum (NQF)-endorsed Perinatal Care measures should be included in the set. Members of the PC TAP are enumerated at: http://www.jointcommission.org/assets/1/18/TAP_Members_Web_List.pdf .

Financial Disclosures/Other Potential Conflicts of Interest

Expert panel members have made full disclosure of relevant financial and conflict of interest information in accordance with National Quality Forum (NQF) and The Joint Commission's Conflict of Interest policies, copies of which are available upon written request to The Joint Commission.

Endorser

National Quality Forum - None

NQF Number

not defined yet

Date of Endorsement

2015 Apr 29

Adaptation

This Perinatal Care measure has been adapted from the following National Quality Forum (NQF)-endorsed measure:

Nosocomial Blood Stream Infections in Neonates [Agency for Healthcare Research and Quality (AHRQ)]

Date of Most Current Version in NQMC

2016 Jul

Measure Maintenance

Every six months

Date of Next Anticipated Revision

Unspecified

Measure Status

This is the current release of the measure.

This measure updates a previous version: Specifications manual for Joint Commission national quality core measures, version 2015B. Oakbrook Terrace (IL): The Joint Commission; Effective 2015 Oct 1. 327 p.

Measure Availability

Source available from [The Joint Commission Web site](#) .

For more information, contact The Joint Commission at One Renaissance Blvd., Oakbrook Terrace, IL 60181; Phone: 630-792-5800; Fax: 630-792-5005; Web site: www.jointcommission.org

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NQMC Status

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Production

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